



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,607	11/24/2003	David M. Lowe	2003B126	4238
23455	7590	04/12/2006	EXAMINER	
EXXONMOBIL CHEMICAL COMPANY 5200 BAYWAY DRIVE P.O. BOX 2149 BAYTOWN, TX 77522-2149				HAILEY, PATRICIA L
		ART UNIT		PAPER NUMBER
		1755		

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/720,607	LOWE ET AL.	
	<b>Examiner</b> Patricia L. Hailey	<b>Art Unit</b> 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 30 January 2006.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 13,16-21,25-39 and 42-51 is/are pending in the application.

4a) Of the above claim(s) 46-50 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 13,16-21,25-39,42-45 and 51 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

Applicants' remarks and amendments, filed on January 30, 2006, have been carefully considered. No claims have been canceled; new claim 51 has been added. Claims 13, 16-21, 25-39, and 42-51 are now pending in this application.

*Election/Restrictions*

1. Claims 46-50 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected process for selectively removing alkynes or diolefins from a feedstock also containing olefins, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 14, 2004.

Claims 13, 16-21, 25-39, 42-45, and 51 (which depends from claim 36) are now under consideration by the Examiner.

*New Objections*

2. *Claim 51 is objected to because of the following informalities:*

Claim 51 should recite "method of claim 36" instead of "process of claim 36". Appropriate correction is required.

3. *The disclosure is objected to because of the following informalities:*

The disclosure contains two "Table 3"s; see pages 20 and 22 of the Specification. Appropriate correction is required.

***Maintained Rejections***

The following rejections have been maintained; although new claim 51 has been added, the subject matter therein is considered to be encompassed by the cited references of record.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

1. *Claims 13, 16-21, 25-37, and 42-44 stand, and new claim 51 is, rejected under 35 U.S.C. 103(a) as being unpatentable over Uzio et al. (U. S. Patent No. 6,498,280).*

Uzio et al. teach a catalyst comprising at least one support, at least one element from Groups 8, 9, or 10 of the Periodic Table, at least one element from Group 14 of the Periodic Table, at least one element from Group 13 of the Periodic Table, and at least one alkali or alkaline earth metal, and, optionally, at least one halogen. See col. 4, lines 8-14 of Uzio et al.

Examples of Groups 8, 9, or 10 metals include rhodium, ruthenium, iron, and cobalt. Although platinum is preferred, the selected metal(s) from these groups is present in the catalyst in amounts ranging from 0.01% to 5% by weight with respect to the total catalyst weight. See col. 4, lines 15-21 of Uzio et al.

The Group 14 element (tin, germanium, lead) is present in an amount ranging from 0.01% to 5% by weight relative to the total catalyst weight. See col. 4, lines 20-25 of Uzio et al.

The Group 13 metal is selected from indium, gallium, and thallium, preferably indium, and is present in amounts ranging from 0.005% to 3% by weight relative to the total weight of the catalyst. See col. 4, lines 26-29 of Uzio et al.

Examples of the support include aluminas. See col. 4, lines 42-80 of Uzio et al.

Patentees' catalyst can be prepared by successive steps of depositing the metals, using any technique known in the art. These deposition steps can be performed in any order. Deposition can be performed by dry or excess impregnation, or by an ion exchange method. Calcining can be performed at temperatures of about 500°C. See col. 4, lines 52-64 of Uzio et al.

The metals can be deposited using any known precursors that are soluble in an aqueous medium; for the alkali and Groups 13 and 14 metals, decomposable salts such as nitrates can be employed. See col. 5, lines 34-45 of Uzio et al.

Uzio et al. do not teach the specifically claimed combinations of Applicants' catalyst compositions, e.g., of a first component comprising rhodium, a second component comprising a metal other than rhodium and a third component different from rhodium and said second component, and selected from Groups 1-15. However, because this reference teaches a catalyst comprising metal components corresponding to those respectively claimed, as well as percentage amounts of these components that are

numerically within the respectively claimed percentage ranges, one of ordinary skill in the art finds ample motivation in selecting the metals disclosed in Uzio et al. to readily obtain Applicants' claimed invention.

With respect to the claim limitations regarding the metal components "predominantly contained in an outer surface layer of the support", it is considered that because Uzio et al. teach that "any technique known to the skilled person" for depositing the metal components is employable to obtain Patentees' catalysts, one of ordinary skill in the art would reasonably expect that the known techniques encompassed by Uzio et al. would result in Patentees' metal components being present on the surface layer of the support.

2. *Claims 13, 16-21, 25-39, and 42-45 stand, and new claim 51 is, rejected under 35 U.S.C. 103(a) as being unpatentable over Shepherd et al. (U. S. Patent No. 6,503,866).*

Shepherd et al. teach a catalyst comprising an alumina support (col. 3, line 7 to col. 4, line 4), and a platinum group component (e.g., ruthenium, rhodium) present in catalytically effective amounts, e.g., from about 0.01 to about 2 mass % of the final catalyst. The platinum group component may be incorporated into the alumina support in any suitable manner, such as coprecipitation, ion exchange, or impregnation, and may be provided by compounds such as rhodium nitrate. See col. 4, lines 8-61 of Shepherd et al.

The catalyst may also contain a Group IVA (Group 14) metal component such as germanium and tin, in amounts ranging from about 0.01 to about 5 mass %. See col. 5, lines 7-58 of Shepherd et al.

Optionally, the catalyst may contain other components or mixtures thereof, which act alone or in concert as catalyst modifiers to improve activity, selectivity, or stability. Examples of these components include rhenium, gallium, indium, nickel, iron, tungsten, molybdenum, zinc, and cadmium. Catalytically effective amounts of these components may be added in any suitable manner to the carrier material during or after its preparation, or to the catalytic composite before, while, or after other components are being incorporated. Amounts of these components range from about 0.01 to about 5 mass % of the composite. See col. 5, line 59 to col. 6, line 4 of Shepherd et al. This disclosure is considered to read upon Applicants' claim limitations regarding the metal components Groups 1-15 of the Periodic Table, as recited in the instant claims.

Further, the platinum-group metal components may be dispersed homogeneously in the catalyst, or may be present as a surface layer component. See col. 4, line 62 to col. 5, line 6 of Shepherd et al. This disclosure, along with the aforementioned disclosure that the modifying components can be added to the composite before, while, or after other components are being incorporated, is considered to read upon the claim limitations that "the first and second components are predominantly contained in an outer surface layer".

In the preparation of the catalyst, following the incorporation of the desired components with the alumina support, a calcination step is employed. Calcination typically takes place at a temperature of from about 370°C to about 600°C. See col. 6, lines 21-42 of Shepherd et al., as well as col. 7, lines 9-39.

Also, a reduction step is employed. Reduction conditions include a temperature of from about 315°C to about 650°C. See col. 7, lines 40-64 of Shepherd et al., especially lines 50-56.

Shepherd et al. do not teach the specifically claimed combinations of Applicants' catalyst compositions, e.g., of a first component comprising rhodium, a second component comprising indium, and a third component different from said first and second components, and selected from Groups 1-15. However, because this reference teaches a catalyst comprising metal components corresponding to those respectively claimed, as well as percentage amounts of these components that are numerically within the respectively claimed percentage ranges, one of ordinary skill in the art finds ample motivation in selecting the metals disclosed in Shepherd et al. to readily obtain Applicants' claimed invention.

*New Ground of Rejection*

The following New Ground of Rejection is being made in view of the Examiner's reconsideration of the instant claims, and in view of the Examiner's discovery of the reference to Rende et al. (U. S. Patent No. 6,486,370).

3. *Claims 13, 16-21, 29-29, 34-39, 42-45, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rende et al. (U. S. Patent No. 6,486,370).*

Rende et al. disclose a catalyst composition comprising an inner core such as alpha-alumina, and an outer layer bonded to the inner core comprised of an outer refractory inorganic oxide such as gamma-alumina. The outer layer has, uniformly dispersed thereon, a platinum group metal such as platinum and a promoter metal such as tin; the outer layer also contains a modifier metal such as lithium. See the Abstract of Rende et al., as well as col. 2, line 40 to col. 3, line 2, and col. 4, lines 55-65 (this latter disclosure additionally recites rhodium and ruthenium as exemplary platinum group metals, indium as an exemplary promoter metal, and alkali metals, alkaline earth metals, and mixtures thereof as exemplary modifier metals).

The catalytic metal components can be deposited on the layered support (i.e., the inner core and the outer layer bonded thereto) "in any suitable manner known in the art". An exemplary method involves impregnating the support with all three types of metals (platinum group, promoter, and modifier) using one common solution, or by sequential impregnation in any order. Another exemplary method involves depositing first the promoter metal, calcining, and then the modifier and platinum group metals simultaneously, followed by calcining at a temperature of about 400°C to about 700°C for a time of about 1 to about 4 hours. See col. 5, lines 50-58 of Rende et al., as well as col. 5, line 59 to col. 6, line 14, which discloses additional exemplary catalyst preparation techniques.

As a final step, the catalyst composition is reduced under hydrogen or other reducing atmosphere; reduction conditions include a temperature range of about 100°C to about 650°C for a time of about 0.5 to about 10 hours. See col. 6, lines 15-23 of Rende et al.

Rende et al. at col. 6, lines 36-40 state that, in preferred embodiments, all three metals are uniformly distributed throughout the outer layer of outer refractory oxide and substantially present in the outer layer. This disclosure is considered to meet Applicants' claim limitations requiring that the "metal components are predominantly contained in an outer surface layer of the support". Further, Examples 1-3 of Rende et al. depict exemplary catalysts having outer layer thicknesses of 107 and 72 microns, respectively, which is considered to read upon Applicants' claim limitations regarding the depth of the surface layer of the support.

The catalyst composition desirably comprises from about 0.01 to about 5 weight percent of the platinum group metal, from about 0.05 to about 10 wt. Percent of the promoter metal, and from about 0.01 to about 5 wt. % of the modifier metal, all percentages based on the entire weight of the catalyst. See col. 6, lines 45-54 of Rende et al.

Rende et al. do not teach the specifically claimed combinations of Applicants' catalyst compositions, e.g., of a first component comprising rhodium, a second component comprising indium, and a third component different from said first and second components, and selected from Groups 1-15. However, because this reference

teaches a catalyst comprising metal components corresponding to those respectively claimed, as well as percentage amounts of these components that are numerically within the respectively claimed percentage ranges, one of ordinary skill in the art finds ample motivation in selecting the metals disclosed in Rende et al. to readily obtain Applicants' claimed invention.

*Response to Arguments*

In response to Applicants' arguments regarding Uzio et al.'s "interest in dispersing the metallic phase", etc., it is the Examiner's position that this reference is relied upon for its teachings regarding the catalyst composition disclosed therein, and to the relevance of that catalyst composition to Applicants' claimed catalyst. The fact that Uzio et al. refer "to increasing the surface area of the metal" does not defer from the reference's teaching of a catalyst composition comparable to that instantly claimed, the extent of distribution on the surface of the support notwithstanding, especially in view of Uzio et al.'s teaching that Patentees' catalyst can be prepared by successive steps of depositing the metals, **using any technique known in the art**. See col. 4, lines 52-64 of Uzio et al.

With respect to Shepherd et al., it is considered that although "all of the metals are described as optional!" (stated by Applicants), such an optionality does not deter the reference from reading upon Applicants' claims in their present form. Further, the teaching that the "platinum group metal may be concentrated in the surface layer,

tapering off in progressing to the center of the catalyst particle" is considered to read upon Applicants' claim limitations regarding the "eggshell-structure" type, because, depending on the particle size of the catalyst, this teaching could read upon the claimed depth of not more than 300 microns.

Although the prior art does not (Uzio et al. and Shepherd et al. ) specifically teach or suggest the claimed depth dispersion in Applicants' claimed catalyst (i.e., a depth of not more than 300 microns), it is the Examiner's position that, because the prior art discloses the employment of metal components comparable to that respectively claimed, in addition to disclosing suitable techniques for incorporating the components into the support, one having ordinary skill in the art would find reasonable expectation that the prior art catalysts would exhibit a catalyst depth comparable to that respectively claimed, given that Applicants' claims are merely directed to the catalyst composition itself, and not any specific methods by which the catalyst is prepared. Further, the methods for obtaining Patentees' catalysts as discussed above are considered to obtain surface layer depths comparable to that instantly claimed.

In response to Applicants' arguments that the prior art does not teach the claimed combinations of metals, the prior art is considered to provide motivation to obtain said claimed combinations. For *prima facie* obviousness, the prior art need not specifically teach a claimed combination, but only to suggest said combination, or provide motivation to obtain it.

Lastly, Applicants' request for reconsideration of the restriction requirement, arguing that "Claim 46 depends from Claim 36 and Claim 47 depends from Claim 1, and Claims 1 and 36 are believed allowable...", has been considered but is respectfully denied.

Applicants' traversed the restriction requirement in a reply filed on October 14, 2004, and presented arguments therein. In an Office Action dated November 30, 2004, Applicants' arguments traversing the restriction requirement were addressed and deemed unpersuasive, and the restriction was deemed proper and made FINAL.

For these reasons, Applicants' arguments traversing the rejections of record are not persuasive.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Patricia L. Hailey*  
Patricia L. Hailey / plh  
Examiner, Art Unit 1755  
April 10, 2006

*KLH*  
**KARL GROUP**  
**PRIMARY EXAMINER**  
**GROUP 1755**